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## Preparation and Administration of the Budget

By

H. S. OWEN,
Ritter Dental Manufacturing Company, Inc.,
Rochester, N. Y.

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### Editorial Department Note

Every year a larger number of businesses is being brought under a more definite and closer control through the use of the formal budget. The campaign of education carried on for this purpose is bearing good fruit. To further interest in the subject as well as to describe definite procedures used in the operation of the budget, many of our chapters find a place on each year's program for at least one budget session. We are publishing this time a talk delivered before the Buffalo Chapter on this subject and expect to follow this with another publication devoted to the actual making of the budget.

The author, H. S. Owen, is production manager of the Ritter Dental Manufacturing Company, Inc., Rochester, N. Y. Since completing his education in the public schools and Mechanics' Institute of Rochester, he has been engaged in various capacities in the metal industry. His experience covers machinist, supervisor of inspection, time observer, planning engineer, development engineer, and is now production manager. In the last-named capacity he has full charge of production, control of materials, time standards department, for all departments including the brass and aluminum foundry. He developed and installed the present production planning system in use at the Ritter plant; has developed a scientific method for determining manufacturing order quantities; has developed and installed special applications of extra wage incentives in various departments; has written several articles on the subject of production and cost as related to production; and has talked before various societies on factory management problems. He is a member of the Taylor Society, the American Management Association, and the Industrial Management Council of the Rochester Chamber of Commerce.

## PREPARATION AND ADMINISTRATION OF THE BUDGET

The three elements of cost are material, labor, and overhead. Material costs are fixed by competition between the manufacturers of the materials; labor costs are standardized through the means of analysis and time-study; and while overhead represents the largest portion of the whole cost, very little has been done in the way of controlling and maintaining overhead at a fair ratio to the other elements.

Overhead is made up of so many indefinite elements that "a mark to be shot at" should be established if the best results are to be obtained. This suggests a budget for all such elements, and also makes possible the payment of an extra incentive for non-producers if expenses are kept below the predetermined standard. Hence, a double purpose is served; first, the largest portion of manufacturing expense will be definitely controlled; and, secondly, an extra wage incentive can be paid non-productive workers on a basis of accomplishment.

I am not personally in favor of paying non-productive workers,

including foremen, on a basis of production, since it is only human nature for everyone to get all of the money he can. When such an incentive is paid, even the foremen will endeavor to get work through that may not be entirely up to standard, in order that extra moneys may accrue to themselves.

On the other hand, if the foremen or other non-productive workers are penalized for repairs to work which is done incorrectly, for unnecessary expense through the waste of supplies, such as tools, scrap and employees spending a longer time on non-productive labor than they should, they immediately make it their responsibility to see that these items are held as low as is physically possible.

You can readily see the contrast between paying an incentive on production and paying an incentive on moneys saved through reduction of overhead. In the first case you pay a bonus even though a reasonably large percentage of the work is not up to standard. In this eventuality it is reasonable to assume that overhead will be materially increased, since parts that are not correct may interfere to a large extent with the assembly of the parts, although no re-work may be necessary. On the other hand, is the bonus paid on the basis of good work turned out at the lowest possible overhead cost? Since our allowances are based on the amount of productive work produced, the more good production turned out, the larger will be the allowance in a given period of time.

The budget affords those in charge of the various departments a means of checking their expenses that is not present when no budget is used.

In the first place, the old method of "post mortem" reports loses its force. Under that method the elapsed time was so long between the time the expense is incurred and the issuing of the report that the details of any one or all of the numerous expenses which made up the monthly report were forgotten long before the report was received. Then too, while the foreman was spending his time analyzing the report, additional unnecessary expense was, no doubt, piling up to which the foreman should be giving his attention, instead of spending it explaining why the last month's expenses were so much higher than they apparently should have been. After all, how is the foreman to know whether or not he is spending too much money when he does not know what his allowances actually are until thirty days later?

I am sure that our plant is no different than any other, and while we try to maintain a normal schedule over a period of time, holidays and absentees make it necessary to alter conditions almost constantly if the schedule is to be met. Therefore, the allowance that will apply one day in a month will not necessarily apply to the same day in the succeeding month. On the contrary, the *budget* not only shows immediately what has been spent, but what is allowed for each succeeding day in advance, so that every charge, whether it be non-productive labor, supplies, or scrap, incurred

during the day, can be checked very carefully, so that the allowance for the day will not be overrun.

A great deal of preparation—to be undertaken by the industrial engineering department—is necessary to inaugurate a budget system, and as yet we have found no better way than to use past performance as a basis for establishing allowances for the various elements of the budget. The entire overhead expense must be analyzed and broken down into certain definite divisions, so that a repetition of any charge can be properly allocated to the account covering that particular division of the overhead.

Fixed charges, such as insurance, depreciation, and interest on investment should not be included in the budget, since the foremen or heads of departments have no control over those items.

Some of the divisions of overhead over which department heads have control are the following:

1. Supervision,
2. Time keeping,
3. Factory supplies,
4. Repairs to production due to the following causes:
   a. Defective material,
   b. Broken tools,
   c. Defective workmanship,
   d. Maintenance of shop equipment,
   e. Maintenance of pulleys, shaftings and hangers,
   f. Maintenance of dies, and jigs.

After the cost accountant has analyzed the total manufacturing expense and subdivided it into a sufficient number of accounts to cover all conditions, he should arrive at an average expenditure for a given rate of production for each element, the sum of all the divisions to equal the total manufacturing expense.

Each account should be thoroughly defined and a copy of this definition furnished to each and every department, so that all charges can be easily and properly allocated. It should be borne in mind that these accounts should be as definite as possible, to facilitate analysis. By this I mean that you should not try to get along with a very few accounts, but rather, that a large number of accounts should be set up, each one to cover a definite, repetitive charge.

If a flat departmental overhead is used these accounts will serve as an excellent basis for arriving at the departmental rate, as well as the basis for the budget allowances.

After these accounts have been in operation for a number of months, some very interesting records will be built up from which standards for each account can be set up. These standards should be set up on a monthly basis and for each account making up the total manufacturing expense. From these records can be determined the proportion of money represented by each account that each department is entitled to and the sum of all allotments to any

one department will be that department's total allowance for the month. For the budget system to be effective, each department head should know at least forty-eight hours after the expense has been incurred how he stands. Accordingly, this monthly allowance should be broken down into daily allowances for each working day in the month. The number of working days varies in different months and, consequently, the daily allowances will vary slightly.

A schedule should be laid out giving the time of day that all tickets should be in the cost department, the time that all tickets should be priced, and the time that the totals for each department should be ready for typing on the daily report and, lastly, the time the report should be typed and distributed.

Our schedule for these different steps is as follows:

11:30 of the following day, all tickets must be in cost department.
3:00 o'clock, tickets priced.
10:00 o'clock of the second day, all figures are ready for typing.
11:45 reports are typed and distributed.

If a schedule is not followed, delays will creep in that destroy the purpose of the report and the report then becomes past history. If such a schedule is followed, price records must be up-to-date in all cases and symbols should be set up for each kind of supply used, and the prices of supplies should be filed under the symbol number in numerical order to facilitate the pricing of the day's supply requisitions.

We do not keep an individual record of materials in the cost department, but rather, our entire inventory is divided into three parts: raw material, supplies, and work in process. The supply inventory is divided up into production supplies, tool supplies and miscellaneous supplies. Therefore, all supplies purchased are charged to the inventory account and withdrawals are credited to it. The individual ledger account of these items is carried in the production planning office. As a new shipment of supplies is received, the price on the invoice is recorded on the price record, this being kept in numerical order by symbol. In pricing out supplies requisitioned from stores, the last price is always used. Supplies lose their identity in the cost department records and the price of any supply can be ascertained by referring to the symbol of same. Keeping this price list up-to-date at all times makes possible extremely rapid pricing of supply requisitions.

The requisitions, when received in the cost department, must be properly made out, bearing the symbol, the account number, the department number, and the quantity requisitioned. These requisitions are made out by the department requisitioning them, and all information is included by them with the exception of the symbol.

The ledger account in the stock room is kept by description and

the supply is requisitioned accordingly, and the symbol appears on this stock ledger sheet. The symbol is affixed by the stock clerk when posting the requisition on the stock ledger. Accordingly, it is not necessary that every department have a record of the symbols; for it can order by description only. In all cases, the one requisitioning the supply should include the account number, because he alone knows what the supply is to be used for.

When these supply requisitions are received in the cost department, they are priced out with the aid of the supply cost record and are totaled by department, showing how much money each department has spent for supplies for the day. This figure is posted on the daily report as against the allowance for the day, and all money spent for supplies previous to this date in the given month is added to the daily amount and is posted on the daily report as against the allowance to date. Hence, a status to date, as well as the daily status can be seen at a glance for each and every department in the plant, as well as for the factory as a whole.

All scrap charges originate with the inspectors in the inspection department, for it is they who decide that the part must be scrapped, as well as the cause for scrapping. Therefore, the inspector in making out the scrap ticket must be sure that there appears on the scrap ticket the proper account number which designates the reason for scrapping, the department number in which the parts were spoiled, the last operation completed, and the number of pieces scrapped. This information is necessary, because we operate on a standard operation cost basis and each and every part has a definite value after each operation has been performed.

An operation cost record is maintained in the cost department showing the standard material cost, the standard labor cost, and the standard overhead cost for each and every operation, as well as the total cost of the piece. These standards are set up once every year and any variations from standard are thrown directly into Profit and Loss instead of altering these operation or piece part standards.

For a recent year our variations at the end of the year were less than one-fourth of one percent, and for that reason the standards of that year were continued throughout the following year. It will be necessary, however, to alter these standards for the current year, since reductions in both productive labor and overhead have been effected, and our standards are now slightly higher than they should be.

After the scrap ticket is made out in the inspection department it goes to the production planning department and is recorded on the process ledger sheet and from there it goes to the cost department, where the ticket is priced and accumulated against the department at fault.

After all scrap tickets are priced out and accumulated by department, the daily and the to-date expense are recorded on the daily report in the same manner as the supply charges, thereby

showing each department at a glance the amount of money spent daily as against their daily allowance, and the accumulation to date as against their accumulated allowance.

Non-productive labor charges are slightly different, in that all departments have a certain amount of fixed non-productive expense, such as supervision, trucking, and clerks. These fixed expenses are only affected when extreme reductions or increases in schedule occur. All other non-productive labor charges originate in the inspection department, where parts are found to be defective due to any one of many causes, some of which are poor workmanship, defective material, error in reading blue-print, etc. It is therefore the inspection department's duty to see that the proper account number is used in repairing these parts, as well as the department at fault, and if it is the operator's fault they must specify that this repair must be performed by the operator on his own time.

After the parts have been inspected and it is found that additional work is required to put them in good condition, they advise the production control station, which makes out the assignment according to the information turned in, and the work is forwarded to the department in which the repair is to be made.

The work is assigned to an operator to make the repair and the actual time taken is recorded on the time ticket and returned to the production-control-station, together with the corrected work. The work is again inspected and if found to be O. K. is passed on to the next operation or to stock if all operations have been completed. The time ticket is then forwarded to the cost department, where the number of hours taken is accumulated by departments on a separate sheet. After all non-productive tickets for the day have been accumulated on this sheet, the number of hours chargeable to each department is extended by the departmental average hourly rate, for the purpose of expediting the budget report. This average hourly rate varies slightly from the actual payroll money, but is within possibly one or two percent of the correct amount and serves the purpose very well.

After the budget workers have finished with the time ticket it is then forwarded to the payroll department, where the non-productive time is extended by the actual operator's rate and this money is accumulated for the month; so that the distribution of overhead will be based upon actual expenditures instead of average departmental rates. The difference between the actual money paid the operators for non-productive labor and the figure as shown on the final daily report for the month is adjusted and a monthly report is made out from the corrected figures. The non-productive labor is shown on the daily labor report—first, the daily expense against the daily allowance, and the accumulated expense for the month to date as against the accumulated allowance for the month to date.

After the supply requisitions have been priced and accumu-

lated for all departments, the scrap tickets priced and accumulated by department, and the non-productive labor hours accumulated and extended by the average departmental rates, the figures are ready to be typed on the daily report. This report presents a true picture at a glance of which departments have lost for the day, whether they have lost on labor, supplies, or scrap, and enables analysis of those irregularities which appear, without the necessity of analyzing all figures for all departments in order to find the excessive charges.

Having this report within forty-eight hours after the expense is incurred, enables us to devise ways and means of eliminating a re-occurrence of excessive charges; and if any charges are justifiable, but still cause a loss, we know immediately what that loss is and can judge from the facts at hand whether or not our allowances are sufficient to cover all conditions.

A master copy of this report is posted in the office and the totals for each department are forwarded daily to each foreman or department head. The foremen show a great deal of interest in these figures, and in most cases find a way—without any help—to plug the leaks; but in the event that there is anything beyond their control, they immediately get in touch with the office to see what can be done to correct the condition.

Sharing in the savings as they do, they have the double incentive of wanting to do their job well and to build up as big a bonus for themselves as they can. The latter is somewhat of a selfish motive, but still it gets results—and that is exactly what we are after.

In establishing these daily allowances, a definite schedule must be laid out as a basis to work from and a given amount of money for each of the elements of overhead must be allowed for each hour of productive labor produced. Therefore, if at the end of the month a department has not produced as many productive hours as its schedule calls for, its allowance is reduced accordingly. On the contrary, if it has produced more productive hours than the schedule called for, its allowance is relatively increased.

For this reason, the monthly report, which is a summary of the daily reports adjusted to the actual conditions, may not be entirely in accordance with the last daily report for the month. It is this monthly report, however, on which the bonus is actually based. Here again the budget serves a purpose that was not taken into consideration when it was inaugurated, and that is just this: a foreman knowing that his allowance will be cut down if he does not produce his schedule, interests himself in the number of hours actually being produced, as well as the number of hours he should produce. He is held in check, however, from producing more hours than he should by only being allowed the proper number of men to produce the required hours.

Absentees affect his allowance, and he, therefore, is endeavoring at all times to weed out employees who are irregular, tardy, etc.

He is penalized for poor work; consequently, he is anxious to have the best class of workers he can possibly secure. He is penalized for machine repairs and he, therefore, makes it his duty to see that his machines are kept in as good condition as possible, so that his machine repairs will be held to a minimum.

Generally speaking, the budget creates an interest in many things which many foremen are liable to neglect where no incentive exists other than the holding of their jobs. The foreman is given the tools to work with and, consequently, is able to control his divisions more efficiently than would be the case if these figures were not in his possession. He knows what is expected of him and how near he is shooting at the mark.

In closing, let me quote a few figures to show what the budget is doing for us:

In 1923, the saving for the entire year amounted to 5.86% of the total manufacturing expense for the year.

In 1924, the saving for the year amounted to 10.51% of the total manufacturing expense for the year.

At the end of the first quarter, or March 31, 1924, a saving of 4.2% of the manufacturing expense for the period had been made.

At the end of the first quarter, or March 31, 1925, a saving of 10.92% of the total manufacturing expense for the period had been saved.

At the end of August, 1925, considerably over 13% of the total manufacturing expense for the year to date had been saved, and we are still forging ahead in the right direction. Since this trend is still downward, it is too early to predict how far we will go below the basis of 1923, but you can rest assured that efforts are not slowing up and we shall continue until we get it down to "rock bottom."